

General

Title

Total knee replacement: percentage of patients undergoing a total knee replacement who had a physical examination completed within one year prior to the procedure that included all of the following: gait, knee range of motion, presence or absence of deformity of the knee, stability of the knee, neurologic status, vascular status, skin, height, and weight.

Source(s)

American Association of Hip and Knee Surgeons. Total knee replacement performance measurement set. Rosemont (IL): American Association of Hip and Knee Surgeons; 2015. 29 p. [25 references]

Measure Domain

Primary Measure Domain

Clinical Quality Measures: Process

Secondary Measure Domain

Does not apply to this measure

Brief Abstract

Description

This measure is used to assess the percentage of patients undergoing a total knee replacement who had a physical examination completed within one year prior to the procedure that included all of the following: gait, knee range of motion, presence or absence of deformity of the knee, stability of the knee, neurologic status (sensory and motor function), vascular status (peripheral pulses), skin, height, and weight.

The American Association of Hip and Knee Surgeons (AAHKS) measures *Assessment of Patient History*, *Physical Examination*, and *Radiographic Evidence of Arthritis* are a composite measure and must be used together. See the following related National Quality Measures Clearinghouse (NQMC) summaries:

[Total knee replacement: percentage of patients undergoing a total knee replacement who had a history completed within one year prior to the procedure that included all of the following: onset and duration of symptoms, location and severity of pain, activity limitations.](#)

Total knee replacement: percentage of patients undergoing a total knee replacement with radiographic evidence of arthritis within one year prior to the procedure.

Rationale

A complete examination of the knee is necessary to plan for the surgical procedure. In addition, the patient's preoperative evaluation is important to determine the severity of the patient's knee arthritis and baseline functionality.

A study conducted by SooHoo and colleagues found that all components of the physical examination were documented only 5 percent of the time for the patients undergoing total knee replacement at the 3 hospitals (SooHoo et al., 2011).

The following evidence statements are quoted verbatim from the referenced clinical guidelines:

The initial contact (for patients presenting with acute knee pain) may not require obtaining radiographs but should rely on a comprehensive history and physical exam.

Significant physical examination:

- Visual inspection for abnormalities
- Presence and location of warmth
- Tenderness (location)
- Presence and location of swelling
- Range of motion (active and passive)
- Meniscal compression
- Varus/valgus instability (0° and 30° of flexion)
- Anterior drawer with + or – Lachman
- Foot pulse
- Presence and location of erythema
- Hip pain or abnormalities present
- Patella apprehension
- Crepitance (American Academy of Orthopaedic Surgeons [AAOS], 2003)

On physical examination, patients with osteoarthritis (OA) often have tenderness on palpation, bony enlargement, crepitus on motion, and/or limitation of joint motion (American College of Rheumatology, 2000).

Evidence for Rationale

American Academy of Orthopaedic Surgeons. AAOS clinical practice guideline on osteoarthritis of the knee. Rosemont (IL): American Academy of Orthopaedic Surgeons; 2003. 17 p. [114 references]

American Association of Hip and Knee Surgeons. Total knee replacement performance measurement set. Rosemont (IL): American Association of Hip and Knee Surgeons; 2013 Jan. 29 p. [25 references]

Recommendations for the medical management of osteoarthritis of the hip and knee: 2000 update. American College of Rheumatology Subcommittee on Osteoarthritis Guidelines. Arthritis Rheum. 2000 Sep;43(9):1905-15. [91 references] [PubMed](#)

SooHoo NF, Tang EY, Krenek L, Eagan M, McGlynn E. Variations in the quality of care delivered to patients undergoing total knee replacement at 3 affiliated hospitals. Orthopedics. 2011 May;34(5):e43-9.

Primary Health Components

Total knee replacement; physical examination

Denominator Description

All patients undergoing a total knee replacement (see the related "Denominator Inclusions/Exclusions")

field)

Numerator Description

Patients who had a physical examination completed within one year prior to the procedure that included all of the following: gait, knee range of motion, presence or absence of deformity of the knee, stability of the knee, neurologic status (sensory and motor function), vascular status (peripheral pulses), skin, height, and weight

Evidence Supporting the Measure

Type of Evidence Supporting the Criterion of Quality for the Measure

A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence

A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences

One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal

Additional Information Supporting Need for the Measure

High Impact Topic Area

During 1991 to 2010, the rate of primary total knee replacement procedures among the Medicare population increased over 161 percent from 93,230 procedures in 1991 to 243,802 procedures in 2010. The rate of revision procedures increased over 105 percent from 9,650 to 19,871 procedures. The majority of the primary total knee replacements were performed on women (approximately 65 percent) (Cram et al., 2012).

The Centers for Disease Control and Prevention (CDC) found that the overall total knee replacement rate increased 58% (from 5.5 to 8.7 per 1,000 population) between 2000 and 2006. Similar increases were observed by sex, age group, and black or white race. Total knee replacement rates were 37 percent lower among blacks than whites (3.6 versus 5.7 per 1,000 population) in 2000, and 39% lower in 2006 (5.6 versus 9.2). In both years, the black/white disparity was lower among women (23% and 28%) than among men (63% and 60%). In 2006, blacks had a lower total knee replacement rate than whites in all 50 states and the District of Columbia (CDC, 2009).

In 2004 there were over 450,000 total knee replacements performed in the United States (American Academy of Orthopedic Surgeons [AAOS], 2008).

Between 2007 and 2009, over 22 percent of adults reported they had been diagnosed with arthritis (CDC, 2010). As the population ages, there will be an increased growth in the number of procedures. It is estimated that the number of total knee replacements performed per year could be over 3 million by the year 2030 (Kurtz et al., 2007).

Costs

Medicare paid approximately \$3.2 billion in 2000 for hip and knee joint replacements (Agency for Healthcare Research and Quality, 2003).

The overall inpatient costs for replacement of the knee during 2007 was over \$9.2 billion with hospital stays of more than 605,000 (Stranges, Russo, & Friedman, 2009).

Evidence for Additional Information Supporting Need for the Measure

Agency for Healthcare Research and Quality. Total knee replacement: summary. Rockville (MD): Agency for Healthcare Research and Quality; 2003 Dec. 8 p. (Evidence report/technology assessment; no. 86). [100 references]

American Academy of Orthopaedic Surgeons (AAOS). The burden of musculoskeletal diseases in the United States. 2nd ed. Rosemont (IL): American Academy of Orthopaedic Surgeons; 2008.

American Association of Hip and Knee Surgeons. Total knee replacement performance measurement set. Rosemont (IL): American Association of Hip and Knee Surgeons; 2013 Jan. 29 p. [25 references]

Centers for Disease Control and Prevention (CDC). Prevalence of doctor-diagnosed arthritis and arthritis-attributable activity limitation --- United States, 2007-2009. MMWR Morb Mortal Wkly Rep. 2010 Oct 8;59(39):1261-5. [PubMed](#)

Centers for Disease Control and Prevention (CDC). Racial disparities in total knee replacement among Medicare enrollees--United States, 2000-2006. MMWR Morb Mortal Wkly Rep. 2009 Feb 20;58(6):133-8. [PubMed](#)

Cram P, Lu X, Kates SL, Singh JA, Li Y, Wolf BR. Total knee arthroplasty volume, utilization, and outcomes among Medicare beneficiaries, 1991-2010. JAMA. 2012 Sep 26;308(12):1227-36. [PubMed](#)

Kurtz S, Ong K, Lau E, Mowat F, Halpern M. Projections of primary and revision hip and knee arthroplasty in the United States from 2005 to 2030. J Bone Joint Surg Am. 2007 Apr;89(4):780-5. [PubMed](#)

Stranges E, Russo A, Friedman B. Procedures with the most rapidly increasing hospital costs, 2004-2007. Rockville (MD): Agency for Healthcare Research and Quality; 2009 Dec. 9 p. (H-CUP Statistical Brief; no. 82).

Extent of Measure Testing

Unspecified

State of Use of the Measure

State of Use

Current routine use

Current Use

not defined yet

Application of the Measure in its Current Use

Measurement Setting

Ambulatory/Office-based Care

Hospital Outpatient

Professionals Involved in Delivery of Health Services

not defined yet

Least Aggregated Level of Services Delivery Addressed

Individual Clinicians or Public Health Professionals

Statement of Acceptable Minimum Sample Size

Does not apply to this measure

Target Population Age

Unspecified

Target Population Gender

Either male or female

National Strategy for Quality Improvement in Health Care

National Quality Strategy Aim

Better Care

National Quality Strategy Priority

Making Care Safer

Making Quality Care More Affordable

Prevention and Treatment of Leading Causes of Mortality

Institute of Medicine (IOM) National Health Care Quality Report Categories

IOM Care Need

Getting Better

Living with Illness

IOM Domain

Effectiveness

Efficiency

Safety

Data Collection for the Measure

Case Finding Period

Unspecified

Denominator Sampling Frame

Patients associated with provider

Denominator (Index) Event or Characteristic

Therapeutic Intervention

Denominator Time Window

not defined yet

Denominator Inclusions/Exclusions

Inclusions

All patients undergoing a total knee replacement

Note: Refer to the original measure documentation for Current Procedural Terminology (CPT) codes.

Exclusions

None

Exclusions/Exceptions

not defined yet

Numerator Inclusions/Exclusions

Inclusions

Patients who had a physical examination completed within one year prior to the procedure that included all of the following: gait, knee range of motion, presence or absence of deformity of the knee, stability of the knee, neurologic status (sensory and motor function), vascular status (peripheral pulses), skin, height, and weight

Exclusions

Unspecified

Numerator Search Strategy

Fixed time period or point in time

Data Source

Administrative clinical data

Electronic health/medical record

Paper medical record

Registry data

Type of Health State

Does not apply to this measure

Instruments Used and/or Associated with the Measure

Unspecified

Computation of the Measure

Measure Specifies Disaggregation

Does not apply to this measure

Scoring

Rate/Proportion

Interpretation of Score

Desired value is a higher score

Allowance for Patient or Population Factors

not defined yet

Standard of Comparison

not defined yet

Identifying Information

Original Title

Measure #1b: physical examination.

Measure Collection Name

Total Knee Replacement Performance Measurement Set

Submitter

American Association of Hip and Knee Surgeons - Medical Specialty Society

Developer

American Association of Hip and Knee Surgeons - Medical Specialty Society

Funding Source(s)

Unspecified

Composition of the Group that Developed the Measure

Total Knee Replacement Work Group Members: David Mauerhan, MD (Co-chair); Jay Lieberman, MD (Co-chair)

American Association of Hip and Knee Surgeons: Nelson SooHoo, MD

American Academy of Orthopaedic Surgeons: James Keeney, MD; Michael Parks, MD

The Knee Society: Jess Lonner, MD; Michael Mont, MD

American Physical Therapy Association: Sara Piva, PT, PhD

Pacific Business Group on Health: Kate Chenok, MBA

American Medical Association (AMA)-convened Physician Consortium for Performance Improvement® (PCPI™): Scott Endsley, MD; Samantha Tierney; Elvia Chavarria

American Association of Hip and Knee Surgeons Staff: Robert Hall; Krista Stewart

Project Consultant: Rebecca Kresowik

Financial Disclosures/Other Potential Conflicts of Interest

None of the members of the Total Knee Replacement Work Group had any disqualifying material interests under the Physician Consortium for Performance Improvement (PCPI) Conflict of Interest Policy. The following is a summary of non-disqualifying interests disclosed on Work Group members' Material Interest Disclosure Statements. Completed Material Interest Disclosure Statements are available upon request.

Work Group Members	Disclosures
David Mauerhan, MD (Co-chair)	Payment for Consulting Services – Biomet, Inc.
Jay Lieberman, MD (Co-chair)	Payment for Consulting Services – De Puy, Inc.

Work Group Members	Disclosures
James Keeney, MD	Officer - Society of Military Orthopedic Surgeons and Mid-America Orthopaedic Association
Michael Parks, MD	Stock Ownership – Zimmer, Johnson and Johnson, Merck, Pfizer, P&G, United Health Payment for Consulting Services – Zimmer Holdings, Inc. Research Support – Zimmer Holdings, Inc. Director – American Academy of Orthopaedic Surgery, American Association of Hip and Knee Surgeons and New York State Society of Orthopaedic Surgeons
Jess Lonner, MD	Stock Ownership – Mako Surgical Research Support – Zimmer, Mako Surgical Speaking Honoraria – Zimmer, Mako Surgical Royalties – Zimmer Service on Speaker's Bureau – Zimmer, Mako Surgical Payment for Consulting Services – Zimmer Scientific Advisory Board – Healthpoint Capital, C D Diagnostics Service on Editorial Board for Several Peer Reviewed Journals
Michael Mont, MD	Research – NIH, Stryker, Tissue Gene, Wright Medical Royalties – Stryker Payment for Consulting Services – Stryker, Tissue Gene, Joint Active Systems, Johnson and Johnson, Salient Surgical
Scott Endsley, MD	None
Sara Piva, PT, PhD	None
Kate Chenok, MBA	None

Adaptation

This measure was not adapted from another source.

Date of Most Current Version in NQMC

2015 Jan

Measure Maintenance

Unspecified

Date of Next Anticipated Revision

Unspecified

Measure Status

This is the current release of the measure.

The measure developer reaffirmed the currency of this measure in October 2015.

Measure Availability

Source available from the [American Association of Hip and Knee Surgeons \(AAHKS\) Web site](#)

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For more information, contact AAHKS at 6300 N. River Road, Suite 615, Rosemont, IL 60018; Phone: 847-698-1200; Fax: 847-698-0704; Web site: www.aahks.org .

NQMC Status

This NQMC summary was completed by ECRI Institute on May 29, 2014. The information was verified by the measure developer on July 21, 2014.

The information was reaffirmed by the measure developer on October 20, 2015.

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Production

Source(s)

American Association of Hip and Knee Surgeons. Total knee replacement performance measurement set. Rosemont (IL): American Association of Hip and Knee Surgeons; 2015. 29 p. [25 references]

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